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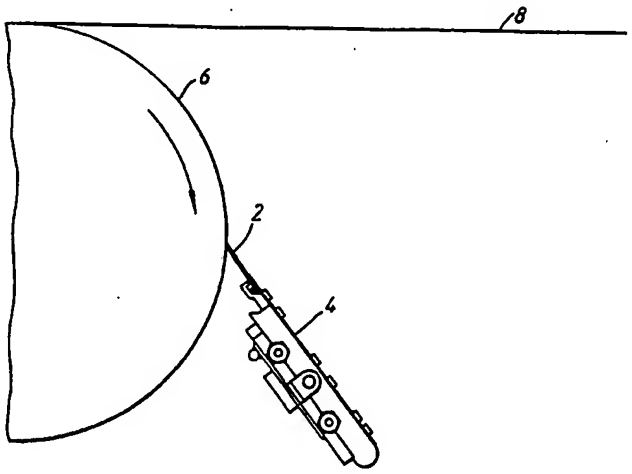

(57) Abstract

A mounting assembly (4) for a scraper blade (2) includes two retaining means (16, 18) to retain between them a first part of the blade (2). The operational part of the blade (2) extends from the retaining means (16, 18) to scrape debris from a roll (6). One of the retaining means (18) is a plate (42) made up of fibrous layers arranged to provide sufficient strength in the direction of extension of the blade (2), and flexibility in the direction perpendicular to this direction of extension. The fibrous layers (28) to (40) are primarily of woven or laid glass fibres but these layers may also include carbon, ceramic, polyester or aramid fibres. These fibres or monofilament reinforced laminations are encapsulated and bonded in a thermosetting resin to provide the required operational properties.

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A MOUNTING ASSEMBLY

The present invention relates to a mounting assembly for a sheet-like member, and is particularly concerned with, but not restricted to, a mounting assembly for a blade.

One example of such a blade is a scraper blade used in the manufacture of paper. A process for manufacturing paper includes passing a wet fibrous material in sheet form over a series of rolls. During this process the water is allowed to drain off, and the fibrous material is heated to assist the drying process. The paper becomes progressively drier during its passage over the rolls, and at the final stages of the process the finished paper is wound onto a roll ready for delivery.

During the earlier stages of the process there is a tendency for damp fibres to come away from the sheet material and for the fibrous material, and other materials used in the process, such as china clay or titanium, to adhere as debris to the rolls. During the later stages of the process when the fibrous material is dry, protruding fibres are removed from the surface of the fibrous material when this material is in contact with heated rolls. This debris causes irregularities in the otherwise smooth cylindrical surface of the rolls. These irregularities are liable to impede the smooth progress of the sheet material over the roll or to damage the material during its passage over the rolls. This problem also arises in the manufacture of other sheet and film materials, such as for example textiles, in which debris on conveyor rolls or cylinders will affect adversely the product being manufactured.

It has previously been proposed to remove the debris by means of a scraper blade mounted at a suitable angle to the roll surface.

Figure 1 is a diagrammatic side view of a known scraper blade mounting assembly and roll,

Figure 2 is a perspective view from above of the mounting assembly and roll of Figure 1,

Figure 3 is a diagrammatic detailed side view of the mounting assembly of Figures 1 and 2,

Figure 4 is a detailed side view of the mounting assembly of Figures 1 and 2 showing the mounting of the scraper blade, and

Figure 5 is an exploded view of a top plate of the invention for the scraper blade mounting assembly.

Referring to Figures 1 to 3, a scraper blade 2 is mounted in a mounting assembly 4 to contact a roll 6 at a region where it is clear of the sheet material 8 being formed into paper. The roll 6 is rotating clockwise, and the sheet material 8 leaving the roll is travelling to the next stage in the manufacturing process.

The mounting assembly 4 comprises longitudinal, transversely spaced fingers 10 mounted on a pivot 12 secured to a support baseplate 14. The blade 2 is retained against a keep 16 at the front of the assembly 4 by a top plate 18 which is removably mounted on the fingers 10 by screws 20. The above-mentioned components of the mounting assembly are made of stainless steel to reduce the risk of corrosion. A flexible sealing strip 22 at the rear of the mounting assembly prevents the entry of dust or other foreign bodies.

Pneumatic tubes 24, 26 are located in the support baseplate 14 forwardly and rearwardly respectively of the pivot rod 12.

Referring particularly to Figure 4, a U-shaped recess 44 is located in, and extends transversely across, the keep 16. The blade 2 is retained between the keep 16 and the top plate 18 by transversely spaced rivets or tabs 46, which sit in the recess 44. These rivets have a depth greater than the distance between the keep 16 and the top plate 18 thereby preventing the blade 2 from being pulled forwardly out of the mounting assembly. The length of the rivets is less than the width of the recess 44, thereby enabling the blade 2 to slide freely in a longitudinal direction while being retained between the keep 16 and the top plate 18. To remove the blade 2 from the mounting assembly, the blade is slid transversely so that the rivets 46 move along the recess 44 and are withdrawn from one end of the recess 44. A replacement blade is inserted by sliding the rivets into the recess 44 from one end thereof.

In a modified construction, a series of transversely spaced U-shaped openings or castellations are formed in the front wall 48 of the keep 16 to extend from the top of the wall 48. These openings are dimensioned to be slightly larger than the transverse cross-section of the rivets 46, and these openings are positioned so that when the blade 2 is moved transversely a pre-selected distance from its normal central operational position, all the rivets 46 are aligned with corresponding openings. When in this position, the blade 2 can be removed by being pulled forwardly to enable the rivets 46 to pass through their corresponding openings. A replacement blade 2 is inserted into the mounting assembly by aligning the rivets 46 with their corresponding openings, pushing the blade into the mounting assembly so that the rivets 46 are located in the recess 44, and then moving the blade 2 transversely into its central operational position. The blade 2 can be made of metal or a suitable composite material.

In operation, the mounting assembly is located in position adjacent to the roll 6 with the scraper blade 2 in contact with the roll at an appropriate angle to the tangent of the roll 6 at the line of contact.

The air pressure in the tubes 24 and 26 is adjusted so as to rotate the fingers 10 about the pivot rod 12 to retain the blade 2 in contact with the roll 6 at the required pressure. An advantage of this arrangement is that the pressure exerted on the roll surface by the blade 2 can be adjusted without having to change the position of the mounting assembly 4.

It is important that the blade 2 can be mounted flexibly so that the blade 2 will maintain contact with the surface of the roll 6 and will follow any irregularities in the roll surface caused by extreme roll camber or high temperatures, but will be robust enough to remove the full width of material should the web of material break during manufacture. It will be appreciated that it is essential therefore for the top plate 18 to possess a "memory" i.e. after deflection caused by an irregularity in the roll surface it will return to its normal operational position.

As previously mentioned, the known top plate 18 is made of stainless steel to reduce the risk of corrosion. The problem arises that if the carbon content of the stainless steel top plate 18 is reduced to improve the corrosion resistance there is a tendency for the top plate to have no such memory. If this situation exists then the top plate 18 is liable to deform and remain out of contact with the surface of the roll 6 after having been deflected.

It is an aim of the invention to alleviate the above-

mentioned problem, and accordingly there is provided a mounting assembly for a sheet-like member, said assembly including two retaining means adapted to retain a first part of said member therebetween with a second part of said member extending from said retaining means, in which one of said retaining means is made up of a plurality of fibrous layers.

The number and orientation of the fibrous layers will depend upon the operational requirements of the sheet-like member, but these parameters are generally chosen to provide sufficient flexural strength in the direction of extension of the sheet-like member from the retaining means, and flexibility in a direction perpendicular to this direction of extension.

Preferably the sheet-like member will be a cutting blade or scraper blade, and in a particular embodiment of the invention the mounting assembly will be part of a paper making plant in which the blade will be used to scrape debris from one or more rolls conveying the sheet-like material during the course of its manufacture. In this embodiment the said one retaining means will be in the form of a top plate which is screwed or bolted to transversely spaced fingers of the mounting assembly to retain a scraper blade against a keep forming the other retaining means of the mounting assembly.

The fibrous layers will be primarily of woven or laid glass fibres, but these layers may also include carbon, ceramic, polyester or aramid fibres depending on the specific properties required for the top plate. These woven or laid fibres or monofilament reinforced laminations are encapsulated and bonded in a thermosetting resin formulation thereby obtaining the required properties to make it suitable for use in a paper machine or in a similar environment.

One embodiment of the invention will now be described by way of example with particular reference to Figure 5 of the accompanying drawings which is an exploded diagrammatic perspective view of the fibrous layers forming one example of a suitable retaining means for the mounting assembly.

Referring to the drawings, one embodiment of the invention consists of the mounting assembly of Figures 1 to 4 in which the top plate 18 of Figure 3 is replaced by the laminated top plate 42 shown in exploded form in Figure 5.

Referring particularly to Figure 5, the laminations 28, to 40 are generally made from woven materials but they may also be laid filaments. In a preferred construction the filaments will be laid at 45° to one another. The individual illustrated laminates are not arranged in any specific order but are illustrated only as typical individual laminations which are arranged randomly. The number of laminations which are used will vary according to the required total thickness of the top plate 42. Although this invention is not restricted to a top plate of any specific thickness, it is envisaged that the top plate thickness could be in the range from a minimum thickness of 1.5mm to a maximum thickness of 5.0mm. Similarly, although the invention is not restricted to a top plate 42 of a specific number of layers, it is envisaged that the number of layers could be in the range from 8 to 30 for example. The material of each layer will depend very largely on the strength and flexibility required from the top plate. It is envisaged that the two outer layers will be made from carbon, ceramic or aramid woven or laid fibres, and that the majority of the inner layers will be made of woven or laid glass. This construction does not however preclude the use of fibres other than glass being used in the inner layers 30 to 38

of the top plate 42. This provides the facility to vary the characteristics of the top plate 42 for strength and flexibility in different thicknesses.

In one method of manufacturing the top plate 42, a fibrous multi-layer top plate already impregnated with partially cured thermosetting resin is pressed at high temperature until the resin is cured to provide the completed top plate 42.

CLAIMS

1. A mounting assembly (4) for a sheet-like member (2), said assembly including two retaining means (16,18) adapted to retain a first part of said member therebetween with a second part of said member extending from said retaining means, in which one of said retaining means (18) is a plate (42) made up of a plurality of fibrous layers (28) to (40); the number and orientation of these fibrous layers depending upon the operational requirements of the sheet-like member.

2. An assembly as claimed in claim 1, in which the number and orientation of the fibrous layers provides sufficient flexural strength in the direction of extension of the sheet-like member from the retaining means, and sufficient flexibility in a direction perpendicular to this direction of extension.

3. A mounting assembly as claimed in claim 1 or claim 2, in which the sheet-like member is a cutting blade or a scraper blade.

4. A mounting assembly as claimed in claim 3, in which the said one retaining means (18) is in the form of a top plate (42) secured to transversely spaced fingers (10) of the mounting assembly to retain a cutting blade or scraper blade (2) against a keep (16) forming the other retaining means of the mounting assembly.

5. A mounting assembly as claimed in any preceding claim, in which the fibrous layers (28) to (40) are primarily of woven or laid glass fibres.

6. A mounting assembly as claimed in claim 5 in which these layers may also include carbon, ceramic, polyester or aramid fibres depending on the specific

properties required for the said retaining means.

7. A mounting assembly as claimed in claim 5 or claim 6, in which these woven or laid fibres or monofilament reinforced laminations are encapsulated and bonded in a thermosetting resin formulation.

8. A mounting assembly as claimed in any preceding claim in which the plate thickness is in the range from 1.5mm to 5.0mm.

9. A mounting assembly as claimed in any preceding claim, in which the number of fibrous layers in the plate (42) is in the range from 8 to 30.

10. A mounting assembly as claimed in any preceding claim, in which the two outer layers (28,40) are made from carbon, ceramic or aramid woven or laid fibres.

11. A mounting assembly as claimed in claim 10 in which the majority of the inner layers (30) to (38) are made of woven or laid glass.

12. A mounting assembly substantially as herein described and shown in the accompanying drawings.

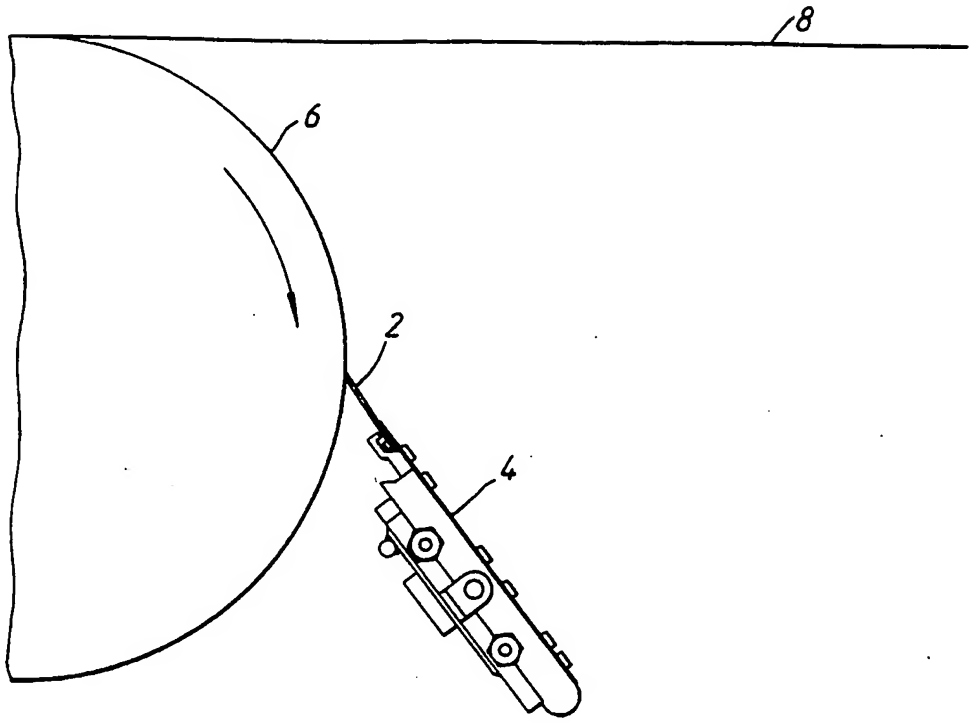

Fig.1.

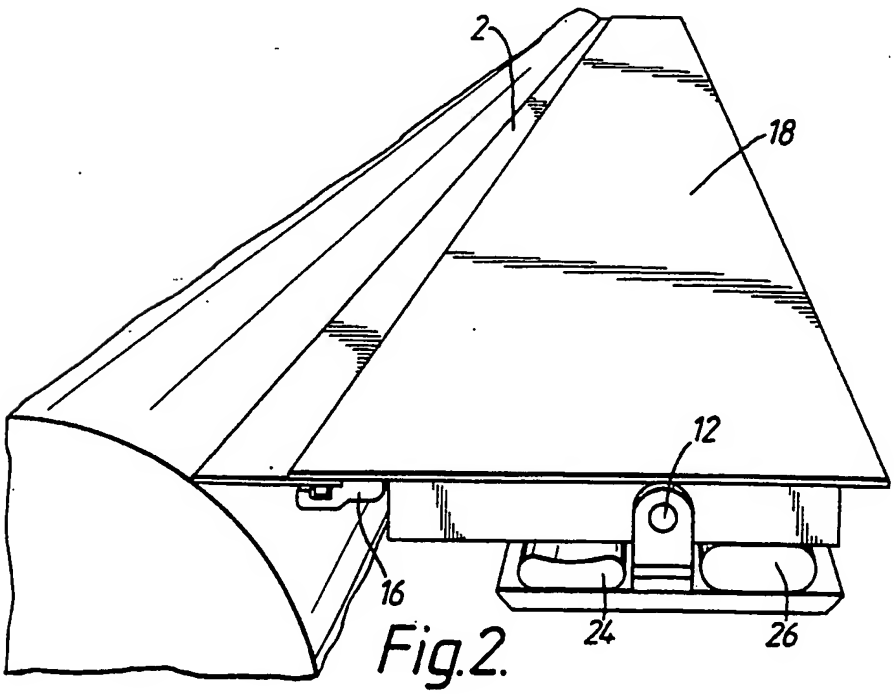

Fig.2.

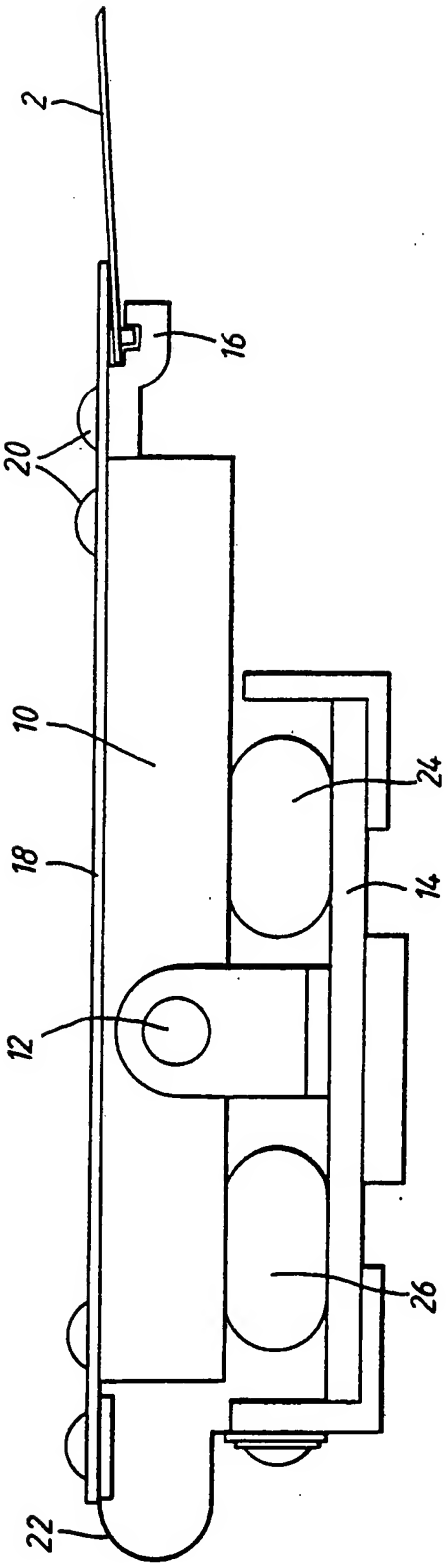

Fig. 3.

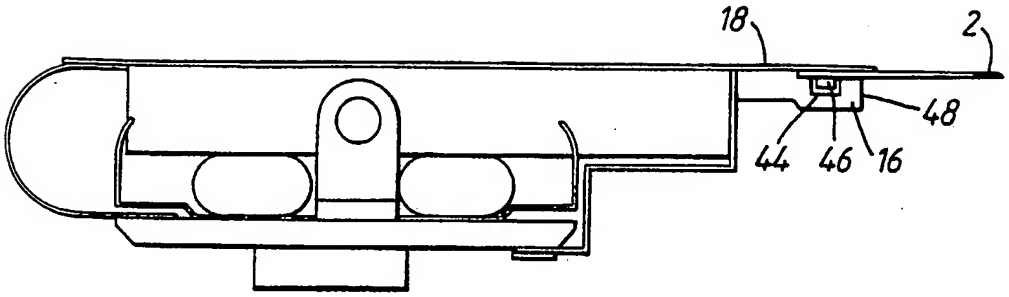

Fig.4.

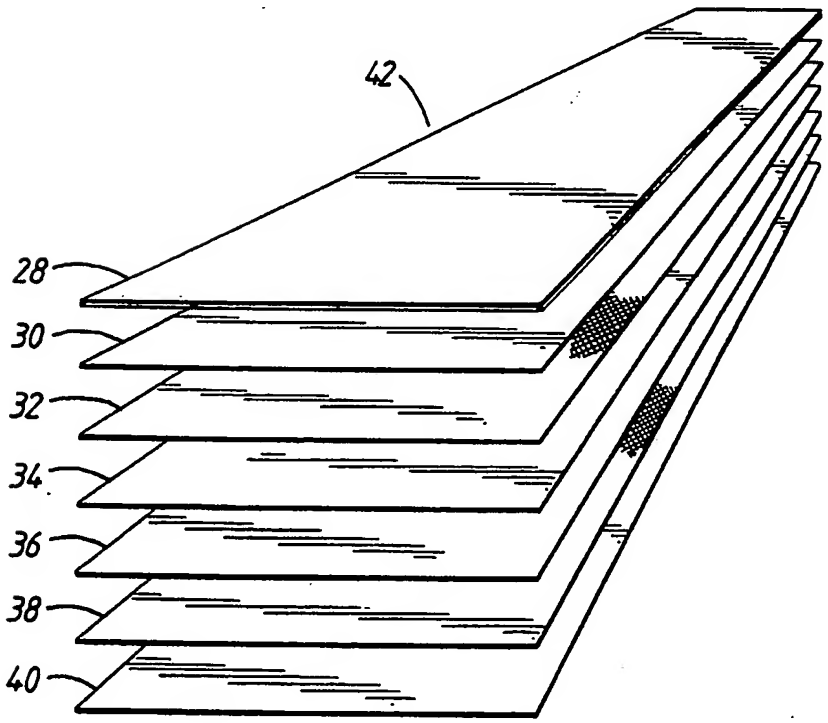

Fig.5.

INTERNATIONAL SEARCH REPORT

International Application N[redacted] PCT/GB 93/00718

I. CLASSIFICATION OF SUBJE[redacted]ATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 D21G3/00

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	D21G

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
Y	US,A,3 163 878 (E. SMITH ET AL) 5 January 1965 see the whole document	1-8
Y	US,A,4 549 933 (JUDD ET AL) 29 October 1985 see the whole document	1-8
A	EP,A,0 294 992 (THERMO ELCTRON-WEB SYSTEMS) 14 December 1988	

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
05 AUGUST 1993	23. 08. 93
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 9300718
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US-A-3163878		None		
US-A-4549933	29-10-85	None		
EP-A-0294992	14-12-88	US-A-	4789432	06-12-88
		DE-A-	3871618	09-07-92
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